

RESPONSE UNDER 37 C.F.R. § 1.111
U.S. Appln. No. 09/285,649

and condensing means. However, it would have been obvious to one skilled in the art at the time of invention that the elements of Konoki are performing the same function as the instant inventions and that there is no significant structural difference required by the instant claim.

Additionally, Claims 10 and 14 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 3,232,982 to Finneran *et al.* and U.S. Patent No. 2,848,493 to Dewling *et al.*

It is asserted in connection with this rejection that:

With respect to claims 10 and 14, Finneran discloses a plant (the figure) comprised of a urea synthesis reactor (2); a first stripping and condensing unit (14) connected to the reactor; a recovery section (including elements 32, 38, 44, 52), and means for feeding a carbamate solution to the stripping unit (62, col. 7, lines 36-41). The only difference between the plant of Finneran and the instant invention is that the first stripping unit and the condensing means are not separate elements, but are a two compartment vessel with the upper part of the vessel being the stripper and the lower part a condenser (col. 5, lines 59-65 and col. 6, lines 16-21). It would have been obvious to one skilled in the art at the time of invention that the stripping unit and means of condensing of the instant invention does not require any structure that differs from the first heating and carbamate condensing zone of Finneran, since they perform the same functions.

Applicants respectfully traverse both of these rejections for the following reasons.

The plant for urea production according to present invention is distinguished from the prior art at least by the feature of subjecting the aqueous carbamate solution obtained in the recovery section to at least partial decomposition in order to remove water from the carbamate solution.

In so doing, the carbamate obtained in the recovery section is recycled to the synthesis reactor substantially free of water thus improving, among other things, the urea conversion yield (see, the instant specification at page 3, lines 19-28, page 11, line 27 to page 12, line 12, and page 13, lines 4-26). In this respect, it should be noted that water is a reaction product of the

specification can
be intended to cover

RESPONSE UNDER 37 C.F.R. § 1.111
U.S. Appln. No. 09/285,649

urea synthesis and thus the presence of water in the carbamate solution recycled to the reactor negatively affects the reaction equilibrium and, therefore, the conversion yield.

Decomposition of the aqueous carbamate solution obtained in the urea recovery section, in accordance with the embodiment of the present claimed invention recited in Claim 7 is achieved by an additional (second) stripping unit 9, and in the embodiment of Claim 10 by feeding the aqueous carbamate solution to the stripping unit 2.

With respect to the embodiment of the present claimed invention recited in Claim 7,
*not claimed
such*
Applicants respectfully submit that Konoki does not teach or suggest separating water from the aqueous carbamate solution obtained in the recovery section and recycling the same to the synthesis reactor.

If, as stated by the Examiner in the Office Action, the second stripping unit 6 or 17 of Konoki belongs to the recovery section, Applicants respectfully submit that it cannot be confused or compared with the second stripping unit 9 according to the present invention.

In fact, the second stripping unit of the invention can only be external to the recovery section since it has the function of decomposing the carbamate in aqueous solution resulting from such a section. In other words, the second stripping unit 9 is not part of the recovery section but it is connected thereto in order to receive the so obtained carbamate in aqueous solution.

It is clear that the second stripping unit 6 or 17 of Konoki cannot operate contemporaneously to separate urea from the aqueous solution of carbamate (*see*, Claim 7, lines 12-16) and to decompose the latter (*see*, Claim 7, lines 18-20).

(17) recovery section. Stripping unit 6 or 17 is not conceived nor arranged for the treatment of carbamate in aqueous solution leaving the recovery section, *i.e.*, for the treatment of unconverted substances that have been previously removed from urea.

On the other hand, also considering the stripping unit 6 or 17 of Konoki external to the recovery section, the characterizing features of the present invention would be totally missing from this prior art.

In fact, stripping unit 6 is directly connected to the first stripping unit 3, which in turn is connected to the reactor 2, for decomposing part of the unconverted reagents from the urea solution (see Konoki, column 5, lines 22-26). Therefore, stripping unit 6 is not conceived nor arranged for the treatment of carbamate in aqueous solution leaving the recovery section (as it is the case for the second stripping unit 9 according to the present invention).

Indeed, stripping units 2 and 3 of Konoki substantially corresponds to the first stripping unit 2 of the present invention, wherein it is aimed to separate a major portion of the unconverted reagents from the urea solution leaving the reactor. In this respect, *see* also the alternative embodiment of Figure 2 of Konoki's with the stripping units 2 and 3 in parallel.

Stripping unit 17 is connected to stripping unit 6 from which it receives an aqueous urea solution to be purified (see for instance Konoki, column 5, lines 36-41). In other words, in stripping unit 17, the urea produced is separated from the remaining portion of unconverted substances. As for stripping unit 6, unit 17 is not conceived nor arranged for the treatment of carbamate in aqueous solution leaving the recovery section, *i.e.*, for the treatment of unconverted substances that have been previously removed from urea.

Stripping unit 17 is part of the recovery section and is substantially equivalent to the units 3 and 4 of the present invention (*see*, for instance, page 9 of the present specification, lines 7-10, page 10, lines 9-13).

RESPONSE UNDER 37 C.F.R. § 1.111
U.S. Appln. No. 09/285,649

Thus, Applicants respectfully submit that it is clear that none of stripping units 6 and 17 of Konoki is structurally and functionally equivalent to the second stripping unit 9 of the present invention. In particular, the provision of a stripping unit to decompose the liquid solution leaving the recovery section (units 17 and 20) and directed to the reactor 2 (flow lines 7 and 8), which would be equivalent to unit 9 of the present invention, is totally missing from the plant according to Konoki et al.

The plant disclosed in Finneran substantially corresponds to the prior art plant shown in Figure 1 of the present application. In fact, the first stripping and condensing unit 14 is equivalent to units 2 and 6 of the specification, the second stripping and condensing unit 22 is equivalent to units 3 and 7 of the specification, and units 32, 38, 44 and 48 of Finneran are equivalent to units 4 and 8 of the specification (Figure 1). In this respect, compare Finneran, column 5, line 59 to column 7, line 28 of the description of the present invention from page 9, line 1 to page 11, line 4.

Although in Finneran means are disclosed for feeding an aqueous carbamate solution to the stripping and condensing units 14 and 22 (flow lines 23 and 26, and 62 respectively), it should be noted that such recycle carbamate is fed unambiguously to the condensing portion of such units 14 and 22 (see column 6, lines 13-14, and column 7, lines 21-24 and 40-41). Flow line 62 of Finneran fully corresponds to flow line 27 of the prior art plant of Figure 1 of the specification, for the recycle of aqueous carbamate from unit 8 to condensing unit 7. Flow lines 23 and 26 of Finneran correspond to flow line 26 of the prior art plant of Figure 1 of the specification, for the recycle of aqueous carbamate from unit 7 to condensing unit 6.

CCS 5/25

RESPONSE UNDER 37 C.F.R. § 1.111
U.S. Appln. No. 09/285,649

Finneran is silent about feeding the carbamate in aqueous solution obtained in the urea recovery section (units 22, 32, 38, 44, 48) to the stripping portion of unit 14, in order to substantially remove the water contained therein before its recycle to the reactor 2.

On the contrary, according to Finneran, this is expressly avoided since the presence of water in the carbamate solution recycled from unit 48 to unit 22 or from unit 22 to unit 14, is desirable. Moreover, water is contained in the carbamate condensate recycled to the reactor 2 (*see* Finneran, column 5, lines 65-71, and column 7, lines 18-25).

In other words, the problem to be solved by the present invention, its solution according to Claim 10 and the advantages resulting therefrom (*see* pages 1-2 above) are totally missing from Finneran.

In view of the foregoing, Applicants respectfully submit that the present claimed invention would not have been *prima facie* obvious from the cited prior art. Accordingly, withdrawal of the rejections is requested.

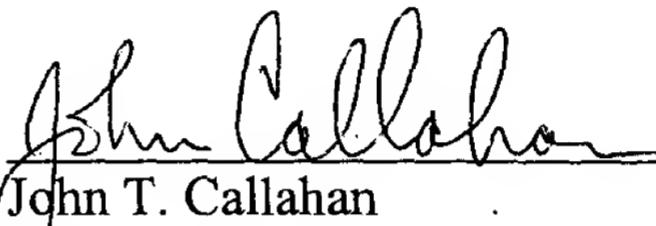
In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

Also, Applicants' undersigned representative notice that the Information Disclosure Statement filed October 20, 2000, was inadvertently filed without a check in payment of the requisite fee. It also incorrectly referred to a Statement under Rule 97(e). In order to avoid any confusion, the IDS is being resubmitted in total concurrently herewith with a check.

RESPONSE UNDER 37 C.F.R. § 1.111
U.S. Appln. No. 09/285,649

Applicants hereby petition for any extension of time which may be required to maintain the pendency of this case, and any required fee, except for the Issue Fee, for such extension is to be charged to Deposit Account No. 19-4880.

Respectfully submitted,


John T. Callahan
Registration No. 32,607

SUGHRUE, MION, ZINN,
MACPEAK & SEAS, PLLC
2100 Pennsylvania Avenue, N.W.
Washington, D.C. 20037-3213
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

Date: March 26, 2001